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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/673,307	09/29/2003	Martin W. Rupich	05770-156002	3889
26161	7590	02/16/2006	EXAMINER	
FISH & RICHARDSON PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			CLEVELAND, MICHAEL B	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 02/16/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/673,307

Applicant(s)

RUPICH ET AL.

Examiner

Michael Cleveland

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2005.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 13-25, 28, 30, 31, 51-58, 66-79 and 81-86 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-25, 28, 30, 31, 51-58, 66-79 and 81-86 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 090905, 120505
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: 020206

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1-6, 9-11, 13-23, 28, 30-31, 51-54, 56, 82-83, and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizuta et al. (EP 0 277 020, hereafter '020), as applied to claims 9, 12, 26, 29, 39, and 42 above, and further in view of Smith '009.

'020 teaches a method comprising:

disposing a precursor solution onto a surface of a layer to form a precursor film (p. 3, lines 5-10), the precursor film including, for example, yttrium stearate, barium naphthenate, and copper naphthenate (Example 11); and

treating the precursor film to form YBCO (col. 3, lines 31-40). Chemical reactions inherently proceed by forming intermediates. Therefore, the method must form an intermediate of the YBCO.

'020 is discussed above, but does not explicitly teach that the barium or yttrium precursors may be fluoroacetates. However, '009 teaches that barium and yttrium fluoroacetates are suitable precursors for the formation of YBCO superconductors, as discussed above. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention

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was made to have used barium fluoroacetate and yttrium fluoroacetate as the particular precursors of '020 with a reasonable expectation of success and with the expectation of similar results because '009 teaches that they are suitable precursors for the formation of YBCO superconductors. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Claim 2, 16, 56: The substrate may be treated for 1 hour (p. 3, line 25).

Claims 3-5, 17-19, 51-54: The solution may contain a Lewis base, such as butanol (Example 11) or amines, such as dimethylamine (p. 2, lines 50-56).

Claim 6, 20-23: The layer may have a thickness of 20 microns (p. 3, lines 33-35).

Claims 9, 15, 26, 82-83, 86: Copper propionate may be used (p. 3, line 40; Example 2).

4. Claims 1-3, 6-7, 13-17, 20-24, 28, 30-31, 51, 56, 58, and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al. (U.S. Patent 6,172,009, hereafter '009) in view of Chen et al. (EP 0 431 813, hereafter '813).

'009 teaches a method comprising:

disposing a precursor solution onto a surface of a layer to form a precursor film, the precursor film including, for example, yttrium trifluoroacetate, barium trifluoroacetate, and copper trifluoroacetate (col. 8, lines 45-53); and

treating the precursor film to form YBCO via an oxyfluoride intermediate (col. 3, lines 36-42).

'009 is discussed above, but does not explicitly teach the use of a copper salt other than the trifluoroacetate. However, '813 teaches that in combinations of precursors to make YBCO superconductors, the copper precursor may be copper ethylhexanoate with only enough copper TFA to add fluorine to the intermediate. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a copper salt such as copper ethylhexanoate in addition to the copper trifluoroacetate of '009 with the expectation of similar results and with the expectation of similar results because '813 teaches that such combinations are suitable copper precursors for forming YBCO superconductors.

Claim 3, 17, 51: The solvent may be ethers or alcohols (Lewis bases).

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Claims 6, 20-23: '009 teaches that the thickness should be greater than 1 micron (col. 10, lines 5-12). '009 does not explicitly teach thicknesses greater than 2 microns. However, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the overlapping portion of the range disclosed by the reference because overlapping ranges have been held to be a *prima facie* case of obviousness, see *In re Malagari*, 182 U.S.P.Q. 549.

Claim 7, 24, 58: The critical current density may be 1.1×10^6 A/cm² (Example 2).

Claim 16, 56: '009 does not explicitly teach that the processing time is less than 5 hours. However, col. 19, lines 9-12 indicates that shorter processing times are desired. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized the treatment time for the optimum balance of semiconductor properties and processing time.

5. Claims 1-3, 6-8, 13-17, 20-25, 28, 30-31, 51, 55-58, 66-79, 81, and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fritzemeier et al. (U.S. Patent 6,022,832, hereafter '832) in view of Chen '813. (Cima et al. (U.S. Patent 5,231,074 is cited as evidence because it is incorporated by reference as giving details of the fluoroacetate method of '832.)

'832 teaches a method comprising:

disposing a precursor solution onto a surface of a layer to form a precursor film, the precursor film including, for example, yttrium trifluoroacetate, barium trifluoroacetate, and copper trifluoroacetate (col. 8, lines 45-53); and

treating the precursor film to form YBCO via an oxyfluoride intermediate (col. 3, lines 36-42).

'832 is discussed above, but does not explicitly teach the use of a copper salt other than the trifluoroacetate. However, '813 teaches that in combinations of precursors to make YBCO superconductors, the copper precursor may be copper ethylhexanoate with only enough copper TFA to add fluorine to the intermediate. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a copper salt such as copper ethylhexanoate in addition to the copper trifluoroacetate of '832 with the expectation of

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similar results and with the expectation of similar results because '813 teaches that such combinations are suitable copper precursors for forming YBCO superconductors.

Claims 2, 16, 56: '832 incorporates Cima '074 to explain the details of the process. The heating may occur for less than five hours (Fig. 1).

Claims 3, 17, 51: '074 teaches that the solvent may be methanol (a Lewis base) (Example 1).

Claims 6, 20-23: The thickness may be 2-5 microns (col. 14, lines 19-22).

Claims 7, 24, 58, 68: The critical current density may be $1-3 \times 10^6$ A/cm² (Example 2).

Claims 8, 25, 55, 57, 66-67: '832 is discussed above, and teaches that defects should be less than 1.5 microns in diameter (col. 14, lines 45-51), but does not explicitly teach that the defects comprise less than 10% or 20 % of the volume of the intermediate. However, '832 teaches that the number of defects should be minimized and that the size of the defects should be minimized (col. 14, lines 37-51). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have minimized the number and size of any defects (and thus the defect volume fraction) because '832 teaches that such defects are undesirable.

Claim 69-71, 78-79, 81: '832 does not explicitly teach critical currents of at least 300 A/cm. However, the preferred range of critical current density ($1-3 \text{ MA/cm}^2$) and thickness (2-5 microns) yields critical currents of 200-1500 A/cm. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a critical current in this range because it results from using the preferred ranges of critical current density and thickness.

Double Patenting

6. Applicant is advised that should claim 3 be found allowable, claim 51 will be objected to under 37 CFR 1.75 as being substantial duplicates thereof. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Applicant is advised that should claim 4 be found allowable, claim 52 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof.

Applicant is advised that should claim 5 be found allowable, claim 53 will be objected to under 37 CFR 1.75 as being a substantial duplicate thereof.

Response to Arguments

7. Applicant's arguments filed 12/5/05 have been fully considered but they are not persuasive.

The rejections under 35 USC 112, 2nd paragraph are withdrawn in view of Applicant's amendments.

The rejections under 35 USC 102 and the rejections under 35 USC 103 in view of single references are overcome by Applicant's amendments, but the amendments do not overcome rejections under 35 USC 103 that may be made on the revised claims.

Applicant argues that claim 12 was not rejected over Mizuta in view of Smith, and that claim 12 was incorporated into claim 1. The argument is unconvincing because claim 12 had been rejected as fully anticipated by Mizuta. Mizuta teaches the use of nonhalogenated copper carboxylates as suitable precursors for forming superconductive films.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Applicant argues that Chen does not disclose rare earth carboxylates. The argument is unconvincing because Smith and Fritzemeier do teach that rare earth carboxylates are suitable precursors for superconducting YBCO films. Likewise, Applicant argues that Smith and Fritzemeier do not teach the use of nonhalogenated copper carboxylates. The argument is unconvincing because Chen does teach that nonhalogenated copper carboxylates are suitable precursors for superconducting YBCO films. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

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The objections to duplicate claims are withdrawn in view of Applicant's cancellations and amendment to claim 71, the Examiner's new observation that claim 83 could refer to Cu(I) propionate, and the Examiner's new observation that claim 55 requires "less than about 20 percent" and claim 57 requires "less than about 10 percent". However, the amendments to the claims raise new objections.


Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fritzemeier et al. (U.S. Patent 6,562,761) is cited for its teachings of calculating critical current density (J_c) from critical current (I_c) and thickness. Cima et al. (U.S. patent 5,231,074 is cited for the reasons stated above.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (571) 272-1418. The examiner can normally be reached on Monday-Thursday, 7-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Michael Cleveland
Primary Examiner
Art Unit 1762

2/13/2005